With this admirable material, and, what is no less important, with the philosophical spirit which a mere specialist always lacks, it is no wonder that a work of the first importance has been produced.

The first chapter gives an appreciative account of the admirable labours of Prof. Grant, and of the subsequent contributions to the subject by Johnston, Bowerbank, Lieberkühn, Carter, Oscar Schmidt, and Kölliker. The defects of Mr. Bowerbank's "Monograph of British Sponges" are clearly pointed out, but its great merits receive equally cordial recognition, while the criticism passed on Dr. Gray's "Classification" is as just as it is severe.

After a description of the methods of examination, the author proceeds to give a detailed account of the anatomy and natural history of the calcareous sponges, and this occupies the greater part of the first volume. The second is devoted to a detailed description of the whole group in systematic order, with diagnosis of species and ample synonomy. The plates in the third volume, drawn by Prof. Häckel with the camera lucida, are admirably exact, though artistic effect is sometimes sacrificed to a somewhat diagrammatic clearness. They remind one of the excellent illustrations of Bronn's "Thierreich."

The class of sponges is divided into *Fibrospongiæ*, including most of Grant's and Bowerbank's siliceous and ceratose genera, *Myxospongiæ*, represented by *Halisarca* and *Calcispongiæ vel Granticæ*. This third class contains three families, Ascones (Leucosolenia Bowerbank), Leucones (Leuconia Bowerbank), and Sycones (Grantia Bowerbank), represented by *Ascetta*, *Leucetta* and *Sycetta* respectively. The genera are chiefly characterised by their spicula.

The author agrees with Oscar Schmidt in deducing all known sponges from a single primitive form (Archispongia, Protospongia), which he supposed to have resembled *Halisarca* more than any other existing genus. He regards the class as very distinct from the Protozoa, and most nearly related to the Cœlenterata, a view with which English readers are familiar from Mr. E. R. Lankester's interesting paper on Zoological Affinities of Sponges in the Annals and Magazine of Natural History (vol. vi. 1870). Indeed it was the position taken by Leuchart himself in 1854, seven years after the sub-kingdom of Cœlenterata had been established by himself and Frey. If we admit that each sponge-pyramid is not a colony of Protozoa, but a multicellular organism, its likeness to a polyp is very striking: the chief differences are the absence of tentacles and of thread-cells. The latter structures, however, have, we believe, been detected in some Mediterranean sponges since the publication of Prof. Häckel's work.

Comparing the "Stammbaum" given at the end of the first volume with that in the third edition of the "Schöpfungsgeschichte" (1872), published five months earlier, we find that the author now makes all sponges descend through "Archispongia," and "Protascus" from an equally hypothetical "Gastræa," while the Cœlenterata diverge from Protascus as Archydra. This makes the affinity less close between Myxospongiæ on the one hand, and between Calcispongiæ and Coralligena on the other. The modification brings the Stammbaum nearer to the classifications actually used by other zoologists and is so far an advantage.

With regard to nomenclature, Prof. Häckel defends the proposal which he made in 1869 to revive the old name of Zoophyta (used by our countryman Wotton in 1552) in order to include sponges (or Porifera) and Cœlenterata (or, as he prefers to call them, Acalephæ). Admitting the justice of the classification, there seems no sufficient justification for the change of names. 1. Priority belongs to the name given by those who first establish true affinities, and not to vague and fanciful names given two hundred years before Linnæus. 2. To say "Zoophyta" is no worse a name to revive than "Vermes" is sufficiently to condemn it. 3. Whether the cavity in a sea-anemone is all stomach or partly perivisceral may admit of dispute, but "Cœlenterata" only affirms that the animal is hollow; and if the term suggests either interpretation, it rather lends itself to Prof. Häckel's. 4. If another word must be invented to apply to Anthozoa (or "Coralla") and Hydrozoa (or "Hydromedusæ") in common, Huxley's "Nematophora," suggested in 1851, is just as good as "Acalephæ," which was used in a more restricted sense by Cuvier. But it is not impossible that before long neither term will be properly exclusive of sponges.

These perpetual changes of names and invention of fresh ones to fit kinsfolk of every shade of propinquity and even avowedly mythological ancestors, is a real drawback to the value of such excellent works as this, and is almost as bad as the endless nomenclature of the species-mongers with whom Prof. Häckel is so justly indignant. However the new wine is still working, and we may say of even "endless genealogies"—

> "Doch sind wir auch mit diesen nicht gefährdet,
> In wenig Jahren wird es anders sein:
> Wenn sich der Most auch ganz absurd geberdet,
> Es gibt zuletzt doch noch 'nen Wein."

And this book will remain an important contribution to philosophical zoology, no less than to the special history of the group to which it is devoted. P. S.

OUR BOOK SHELF

Grotesque Animals. Invented, Drawn, and Described by E. W. Cooke, R.A., F.R.S., F.G.S., F.Z.S., &c. (London: Longmans, Green, and Co., 1872.)

MR. E. W. COOKE possesses so high a reputation, not only as one of the leading artists of the day, but also as a man eminently devoted to science, as evidenced by the fact of his having attained the double distinction of Royal Academician and Fellow of the Royal Society, that anything proceeding from his pencil cannot fail to be worthy of notice, and we have accordingly looked through this quaint collection of facsimile drawings with very great interest. Mr. Cooke states, in his preface, that he commenced this series of "grotesque combinations," to which he also assigns the euphonious title of "Entwickelungsgeschicte" (history of development), while seeking rest and relief on the Somersetshire Coast after the dissipation attendant upon the meeting of the British Association at Manchester, in 1864, and that the idea of publication was forced upon him by friends who wished to have copies of the drawings. We are not surprised at his numerous friends and admirers desiring that these results of his holiday recreations should be given to the world; for, apart from the merits of the drawings in an artistic point of view, containing, as they do, powerful delineations of animal forms, they exhibit a singular and

© 1873 Nature Publishing Group

amusing fertility of imagination, the *disjecta membra* of birds, beasts, and fishes, being worked up together in a variety of fantastic forms which it would puzzle Mr. Darwin or Professor Owen to classify. The plates are accompanied by short descriptions, also by Mr. Cooke, and intended, he says, "as a key to aid the unintiated in animal lore." We give our readers the following descriptions as a sample:—"Plate v. No. 1. An odd fish—Platax—with dress of a bivalve shell, *Pecten Gibbosus.* The feet of a sprat-loon, *Colymbus Stellatus*, and tail of Beroe. No. 2. *Encrinus entrocha*, a Lily-encrinite, wears the head-dress of a porpita, one of the Acalephæ. Her dress being of Flustra, her right arm is a Pentelasmis, her left a species of Serpula. No. 3. This pig-faced lady, whose body is '*Parasmilia centralis*,' has wings of *Avicula cygnipes* (both species from the chalk), and limbs of a bird (species unknown). . . Plate x. No. 1. This scaly creature, capped by Cephalaspis, has the feet of a Brazilian porcupine, the heterocercal tail of a Palæozoic fish, and the lower jaw and tusks of Dinotherium wherewith to scratch himself. . . Plate xiii. No. 3. This ancient spinster, truly Palæozoic, has the triturating teeth of a fish, *Cestracion Philipi*; her cap is an Argonauta, her body that of the Port Jackson shark, her fan (Spanish, of course) a Renilla. *Isis hippuris* furnishes her arms . . . Plate xviii. No. 1. This hollow character, formed of the lower jaw of the hippopotamus, has very diverse arms, the right being an Ancyloceras, the left *Hamites attenuatus.* His head-gear is well got up with hide, horns, and the beak of a spoonbill! . . . Plate xx. No. 1, thanks to Monte Bolca and its elevated strata of *dried* fish, we have *Semiophorus vellifer* (a fish of the Eocene.) With Scutes on his neck, and the claws of a lion, he walks his chalks; an upper cretaceous shell, *Plagiostoma spinosum*, defends his body." Many of the plates remind us of the gambols of the crustaceæ and other marine animals in *Babil and Bijou*, and we have no doubt that Mr. Boucicault, in his next attempt to "improve the British Drama," will find in this volume an endless variety of suggestions for humorous stage effects. We must not omit to mention the admirable manner in which the drawings have been reproduced by Mr. Sawyer of the Autotype Fine Art Company, the plates being exact facsimiles of the drawings. We anticipate an extensive circulation for this beautifully-executed and entertaining work. G. I. F. C.

Abstract of the Reports of the Surveys and other Geographical Operations in India for 1870-71.

We learn from these reports that during the season of 1870-71, the Great Trigonometrical Survey has been proceeded with on six series, and the complete work is represented by 11,203 square miles of principal, and 10,076 of secondary triangulation. The total area surveyed up to 1871 by the Topographical Surveys which do not include the Topographical work of the Trigonometrical Survey, is 665,909 square miles, three times the area of France. The Geological Survey has been going on more briskly than in previous years, and the Geological Surveyors are gradually building up the materials which will enable a geological map of India to be prepared. The tidal observations, from which much was expected, and for which gauges were made and sent out to India more than two years ago, were not gone on with on account of the financial difficulties of the Indian government. The government has finally adopted Mr. Hunter's plan for the spelling of Indian names; it is as near an approach to what is known as the "scientific system," as the public in the present state of education are able to endure. The "scientific system" consists in scrupulously rendering letter for letter, without any particular care to preserve the pronunciation. Uniformity in the spelling of geographical names is a great matter, no matter on what principle it may be based.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.*]

Inherited Instinct

The following letter seems to me so valuable, and the accuracy of the statements vouched for by so high an authority, that I have obtained permission from Dr. Huggins to send it for publication. No one who has attended to animals either in a state of nature or domestication will doubt that many special fears, tastes, &c., which must have been acquired at a remote period, are now strictly inherited. This has been clearly proved to be the case by Mr. Spalding with chickens and turkeys just born, in his admirable article recently published in *Macmillan's Magazine.* It is probable that most inherited or instinctive feelings were originally acquired by slow degrees through habit and the experience of their utility; for instance the fear of man, which as I showed many years ago, is gained very slowly by birds on oceanic islands. It is, however, almost certain that many of the most wonderful instincts have been acquired independently of habit, through the preservation of useful variations of pre-existing instincts. Other instincts may have arisen suddenly in an individual and then been transmitted to its offspring, independently both of selection and serviceable experience, though subsequently strengthened by habit. The tumbler-pigeon is a case in point, for no one would have thought of teaching a pigeon to turn head over heels in the air; and until some bird exhibited a tendency in this direction, there could have been no selection. In the following case we see a specialised feeling of antipathy transmitted through three generations of dogs, as well as to some collateral members of the same family, and which must have been acquired within a very recent period. Unfortunately it is not known how the feeling first arose in the grandfather of Dr. Huggins's dog. We may suspect that it was due to some ill-treatment; but it may have originated without any assignable cause, as with certain animals in the Zoological Gardens, which, as I am assured by Mr. Bartlett, have taken a strong hatred to him and others without any provocation. As far as it can be ascertained, the great-grandfather of Dr. Huggins's dog did not evince the feeling of antipathy, described in the following letter.

Charles Darwin

"I wish to communicate to you a curious case of an inherited mental peculiarity. I possess an English mastiff, by name Kepler, a son of the celebrated Turk out of Venus. I brought the dog, when six weeks old, from the stable in which he was born. The first time I took him out he started back in alarm at the first butcher's shop he had ever seen. I soon found he had a violent antipathy to butchers and butchers' shops. When six months old, a servant took him with her on an errand. At a short distance before coming to the house, she had to pass a butcher's shop; the dog threw himself down (being led with a string), and neither coaxing nor threats would make him pass the shop. The dog was too heavy to be carried; and as a crowd collected, the servant had to return with the dog more than a mile, and then go without him. This occurred about two years ago. The antipathy still continues, but the dog will pass nearer to a shop than he formerly would. About two months ago, in a little book on dogs published by Dean, I discovered that the same strange antipathy is shown by the father, Turk. I then wrote to Mr. Nichols, the former owner of Turk, to ask him for any information he might have on the point. He replied—'I can say that the same antipathy exists in King, the sire of Turk, in Turk, in Punch (son of Turk, out of Meg) and in Paris (son of Turk, out of Juno). Paris has the greatest antipathy, as he would hardly go into a street where a butcher's shop is, and would run away after passing

© 1873 Nature Publishing Group